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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,475	09/29/2006	Niall James Caldwell	1025-P04207US0	9543

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DANN, DORFMAN, HERRELL & SKILLMAN
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EXAMINER	
STIMPERT, PHILIP EARL	

ART UNIT	PAPER NUMBER
3746	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/599,475	CALDWELL ET AL.	
	Examiner	Art Unit	
	Philip Stimpert	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/28/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the multiple working chambers of claims 1 ("each of which") and claim 6 ("they") must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 1 is objected to because of the following informalities: lines 1-2 recite "A fluid-working machine with variable volume working chamber, each of which is connected…" If "working chamber" is intended to be singular, then an article is required before "variable," and the singular does not agree with the use of the phrase "each of which."

3. Claim 4 is objected to because of the following informalities: line 4 recites "at time close to the time" which omits an article before the first "time".

4. Claim 6 is objected to because of the following informalities: lines 2-3 recite "decides whether to isolate working chamber, as they reach…" An article is missing before "working chamber," and the singular "working chamber" does not agree with the plural "they." Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Regarding claim 1, the singular recitation of "variable volume working chamber" does not agree with the plurality implied by "each of which." However, only a single working chamber is shown in the drawing. As such, one of ordinary skill is not properly informed of the scope of this claim.

8. Further regarding claim 1, the recitation of “the flow path” in line 4 lacks antecedent basis in the claim.

9. Regarding claim 3, the limitation, "the phase angle" lacks antecedent basis in the claim. Further, it is unclear how the phase angle itself might have an input signal which could be received by the controller. The examiner will interpret this limitation as signifying that the controller receives “an input signal indicative of a phase angle of a shaft of the machine."

10. Regarding claim 5, the following limitations lack antecedent basis in the claim:

a. “the previous flow demand," line 2

b. “the actual displacement error,” line 3

c. “the ongoing accumulated displacement error,” line 5.

11. Regarding claim 6, the claim is indefinite for similar reasons to claim 1. The claim recites “decides whether to isolate working chamber, as they reach…” The singular recited working chamber conflicts with “they,” while the plural "they" conflicts with the embodiment shown in the drawing.

12. Regarding claim 7, no shaft has been recited, so the recitation of “sensed shaft speed” is indefinite.

13. Further regarding claim 7, no cylinders have been recited, so the working and idle cylinders of line 3 lack antecedent basis.

14. Further regarding claim 7, the recitation of “the shaft speed increase” lacks antecedent basis in the claim.

15. Regarding claims 8 and 9, the recitation of "an expansion stroke" constitutes a second positive of that limitation, after the first in claim 4.

16. Regarding claim 10, the recitation of "the loss of energy" lacks antecedent basis in the claim.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 1,774,662 to Parks (Parks) in view of US patent 5,456,581 to Jokela et al. (Jokela) and US patent 5,259,738 to Salter et al. (Salter).

19. Parks teaches a fluid working machine (Fig. 1) with a variable volume working chamber (11) which is connected to a commutator valve (55) which alternately connects the working chamber (11) to either of two manifolds (46, 65/54), and a flow path (51) between the chamber (11) and the commutator valve (55). Parks does not teach a valve in the flow path (51). Jokela teaches a fluid working machine having several working chambers (53) and having electronically controlled valves (84) in the inlet to the chamber. Jokela teaches these valves as elements in a system for regulating the outlet pressure. However, the valves (84) of Jokela also operate as check valves regulating inlet flow, and cannot be closed on command. Since the commutator valve of Parks handles inlet and outlet flow switching and checking, one of ordinary skill would

appreciate that a different type of valve would be needed in order to obtain the pressure regulation of Jokela. Salter teaches a solenoid valve (13) which allows electronic closure of a passageway. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the pump of Parks with solenoid valves as taught by Salter provided in the flow path (51) as taught by Jokela in order to regulate the outlet pressure of the pump of Parks.

20. Regarding claim 2, Jokela and Salter both teach that the valve is electronically controlled.

21. Regarding claim 3, Jokela teaches a shaft position sensor (102) which provides information to a controller (104) as to when the shaft passes a known phase angle (col. 4, ln. 5-22). Since the shaft position sensor (102) provides information to the controller (104) as part of the pressure regulation system being provided to Parks by the instant combination, it would have been obvious to provide the pump of Parks with a shaft position sensor as taught by Jokela in order to provide the information necessary for pressure regulation (see Jokela, col. 4, ln. 5-22).

22. Regarding claim 4, in modifying the pump of Parks, it would be obvious to one of ordinary skill to use the valves provided per the teachings of Jokela and Salter to isolate the working chamber in order to effect a decrease in outlet pressure. Further, the working chamber volume is a cyclic variable. Therefore the volume may be considered to be "approaching its minimum" at substantially any point in the cycle, since a minimum will be encountered thereafter. Finally, "close to the time" is considered to be very

broad language reading on any point in the cycle. Thus any particular point of actuation of the valve is considered to satisfy the language of claim 4.

23. Regarding claim 5, Salter teaches that a control system for a pump which takes cylinders out of service may be run by a controller to sum a previous flow demand relative to the output flow to create a total displacement demand and compare it with an error, and based thereon, to choose whether to activate a particular cylinder in order to minimize ongoing displacement error (col. 6, ln. 10-55). It would have been obvious to one of ordinary skill in the art to apply this method as taught by Salter to the pump of Parks as controlled by the controller of Jokela, in order to minimize errors in a system employing the pump.

24. Regarding claim 6, Salter teaches a controller reading demand from an external signal line (col. 6, ln. 34-36) in order to regulate volumetric flow rate (col. 6, ln. 27-31) by deciding whether or isolate or activate working chambers.

25. Regarding claim 7, Jokela teaches maintaining constant output pressure, which one of ordinary skill in the art would expect to be effectively proportional to throughput flow. One of ordinary skill would expect the ratio of working to idle cylinders to fall as shaft speed (measured by shaft encoder 102) rises, in order to maintain the constant output pressure.

26. Regarding claim 8, Salter teaches an apparatus which may be configured as a motor. One of ordinary skill would appreciate that such a configuration would be possible with the pump of Parks, for instance by reversing the commutator valve (55). So modified, the controller would be able to choose the actuation point of the valve

member. As such, it is capable of performing the function set forth by claim 8. The examiner notes that claim 8 merely requires that the controller "can choose" to operate as specified.

27. Regarding claim 9, Parks teaches that the apparatus is arranged to function as a pump. Further, the controller would be able to choose the actuation point of the valve member. As such, it is capable of performing the function set forth by claim 9.

28. Regarding claim 10, the controller of the combined references would be able to choose the actuation point of the valve member. As such, it is capable of being operated in the fashion set forth by claim 10.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Stimpert whose telephone number is (571)270-1890. The examiner can normally be reached on Mon-Fri 7:30AM-4:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/P. S./
Examiner, Art Unit 3746
8 May 2009